Acupuncture for Zoological Companion Animals

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- Traditional Chinese veterinary medicine • Analgesia

Veterinarians increasingly are asked by clients to advise them on the efficacy of complementary and alternative veterinary medical therapies for the treatment of their pets. Research in the human and veterinary medical fields of complementary and alternative medicine (CAM) has increased dramatically in recent years, and as a result clients are more aware of these treatment modalities either as the result of direct experience or via exposure to the literature and media. A 1993 article in the *New England Journal of Medicine* estimates that 1 in 3 adults uses some form of unconventional medicine and 70% of those patients do so without the advice or knowledge of their primary care practitioners.[1,2] The investigators suggest that the lack of communication between practitioner and patient exists because most physicians have little understanding of alternative therapies. Veterinarians are facing a similar situation, and we would be wise to learn from our physician colleagues and strive toward better client communication by gaining a general understanding of the basic principles of common complementary and alternative veterinary medical therapies.

Critics of CAM and complementary and alternative veterinary medicine (CAVM) often cite desperation, lack of knowledge, or misguided goals as the reasons veterinary clients and human patients pursue alternative therapies.[3] The fear of the outcome of serious diseases, feelings of helplessness, and the hope for cure or relief of pain are reasons that veterinary clients and human patients seek both conventional and alternative medical therapies.[3] Not all conventional therapies are supported by in-depth studies, and many times outcomes of accepted conventional treatments do not yield

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the results physicians and veterinarians hope for, yet these are offered as treatment options. Experimental surgeries and therapies are often recommended based on limited experience in situations where scientific evidence is not available, yet many medical professionals will omit alternative therapies for reasons of limited scientific evidence. Medical professionals may evaluate the efficacy of a therapy based on experience, but a causal relationship should not be established by clinical experience alone.

CAVM includes a wide range of therapies including acupuncture, herbal medicine, chiropractic, tui na (pronounced twee-na), massage, food therapy (nutrition), and homeopathy. A veterinarian cannot be expected to be well versed on all CAVM modalities, but a basic knowledge of the most available and most scientifically researched therapies is helpful, in addition to establishing professional relationships with local veterinary practitioners trained in CAVM modalities to facilitate referrals.

Wynn and Wolpe[3] present a workable model of ethical considerations when considering alternative therapies for a veterinary patient, adapted from a human model presented by Adams and colleagues.[4] Wynn and Wolpe recommend first assessing the severity and acuteness of the illness, and then evaluating the potential for cure using evidence-based treatment. Next, the conventional treatment should be compared with the alternative treatment with regard to invasiveness and toxicity. Third, the quality and legitimacy of the evidence for efficacy and safety of the alternative therapy is evaluated. Lastly, ethical use of CAVM depends on the client's level of comprehension of all aspects of the alternative therapy, including risks and cost.

The report of CAM therapies generated by the Institute of Medicine (IOM) at the National Academy of Sciences in 2005 presented a virtually identical format for human patient assessment when considering alternative treatment. The report noted that the goal should be the provision of comprehensive medical care that is based on the best scientific evidence available regarding benefits and harm, which encourages patients to share in decision making about therapeutic options, and that promotes choices in care that can include CAM therapies when appropriate.[5,6] The report stated that appropriate, comprehensive medical care included "suspending any categorical disbelief in CAM therapies".[6]

Acupuncture represents the most commonly practiced and extensively researched of all the CAM and CAVM modalities. It is considered a valid therapeutic mode of treatment that can be integrated into Western veterinary medicine for the treatment of large, small and zoological companion animal patients.[1,2,7–9]

LEGALITY AND TRAINING (IN THE UNITED STATES)

In 2007, the American Veterinary Medical Association (AVMA) presented guidelines on CAVM in its AVMA directory and resource manual.[10] These guidelines stated that the use of CAVM was in accordance with the practice of veterinary medicine, and that veterinarians who choose to use CAVM techniques should acquire the requisite skills and education to perform these treatment modalities. The guidelines also stated that all veterinary medicine, including CAVM, should be held to the same standards, and that claims of safety and efficacy should be proven by the scientific method.

In most states in the United States veterinary acupuncture must be performed by a licensed veterinarian, but there are presently no regulations ensuring the competence of a veterinary acupuncturist. Specialized courses and certification training in veterinary acupuncture are offered at several institutions in the United States:

- Chi Institute, Gainesville, Florida (www.tcvm.com)
- International Veterinary Acupuncture Society (IVAS), Fort Collins, Colorado (Ivasoffice@aol.com)

- Medical Acupuncture for Veterinarians at Colorado State University, Fort Collins, Colorado, contact Colorado Veterinary Medical Association (CVMA) at 303 318 0447 or email info@colovma.org.

Programs at these institutions offer veterinarians intensive training in the theory and technique of small and large animal acupuncture. Zoological companion animal veterinarians who consider referring patients to a veterinary acupuncturist are advised to inquire as to the individual's training and experience. This article will hopefully serve as a guide for the zoological companion animal practitioner who is considering either incorporating complementary medicine into his or her practice, or referring patients to an acupuncturist.

DEFINITION OF ACUPUNCTURE

The word acupuncture is derived from the 2 Latin words *acus*, needle and *pungere*, to pierce or prick. Acupuncture involves the use of solid, extremely fine, needles to diagnose, treat, and prevent disease by stimulating the body's own ability to heal. Hypodermic needles can create some of the same effects of acupuncture therapy, but because of the relatively large diameter, their use can cause more local tissue damage. The goal of acupuncture is to create the least amount of trauma to the body while eliciting the greatest beneficial effect.[11] The use of fine, solid needles is referred to as dry needle acupuncture (**Fig. 1**), while other related techniques may involve injection of small amounts of fluid, aquapuncture, and the use of electrical stimulation on acupuncture needles called electroacupuncture, to name a few. The aquapuncture technique uses a fluid (eg, vitamin B12 or saline) to create prolonged stimulation at an acupuncture site, or in situations where the patient will not tolerate retention of a dry needle for any period of time. Electroacupuncture is used to enhance neuromodulation and stimulate the release of different neurochemicals through variation of electrical frequency and duration of treatment.

There are more than 80 different acupuncture techniques in China alone, with additional methods practiced in Korea, Japan, Europe, Vietnam, and the Americas. The various techniques share a similar diagnostic and therapeutic approach, but there is no universal "traditional Chinese acupuncture," just as Western medicine is interpreted and practiced differently throughout the world despite its shared principles and theories.[12]

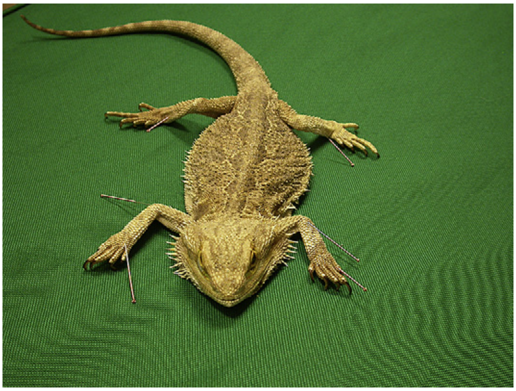

Fig. 1. Bearded dragon (*Pogona vitticeps*) undergoes dry needle acupuncture therapy.

HISTORY OF ACUPUNCTURE

The precise origin of acupuncture is still debated, but evidence exists that acupuncture was practiced as long as 5000 years ago, and not solely in China.[11] The Egyptian medical treatises of 1550 BC made reference to acupuncture-like treatments, and there is a Hindu reference to acupuncture in the Aveda scriptures dated 1300 BC. South African Bantu tribesmen and North American Eskimos used sharp bones and stones to scratch parts of their bodies to treat disease. Evidence suggests that acupuncture developed throughout the world both by demonstration and description among individuals, and also spontaneously among people who did not experience cultural cross-over. The well-preserved remains of a man in the Tyrolean Alps, dated more than 5000 years old, revealed evidence of a skin-piercing technique resembling a form of acupuncture, suggesting the use of acupuncture in Central Europe around 3200 BC.[13,14]

Chinese acupuncture dates back more than 2500 years, with the first veterinary acupuncture text, Bai-Li's Canon of Veterinary Medicine, written in 620 BC.[15] The Chinese developed acupuncture techniques as one part of a much larger and multifaceted system of medicine referred to as Traditional Chinese Medicine (TCM) for humans and Traditional Chinese Veterinary Medicine (TCVM) for animals. For the sake of simplicity, contemporary acupuncture can be described as either traditional Chinese medical acupuncture or Western medical acupuncture (also referred to as transpositional acupuncture in veterinary medicine).[16,17]

Traditional Chinese acupuncture originated from agrarian and environmental roots, where health is determined by metaphysical concepts of energy flow within the body and the effects of the surrounding environment. The traditional Chinese acupuncture system describes good health on the basis of a balance between opposite forces (Yin and Yang) and the flow of energy, "life force" or *qi* (also spelled *chi*, both pronounced "chee").[16]

It is thought that *qi* flows along definite paths or "meridians" in the body, and disease conditions represent a blockage or disruption of flow of this energy. Disease assessment is based on detailed observational clues including tongue appearance, mental attitude, the appearance and odor of feces and urine, palpation of painful areas or trigger points on the body, and overall body condition (eg, integument, nails, posture, and muscle tone). The ancient Chinese also described in great detail the different pulse qualities they felt at arterial loci, and they believed that these variations in pulsation points were caused by alterations in *qi*. The most commonly presented theory of TCM/TCVM is based on energetic, not anatomic, concepts.[2]

It is extremely challenging for most present-day health care providers to embrace the traditional Chinese theory and its complex, though elegant, metaphysical concepts, as they clash so strongly with mainstream Western medicine and its contemporary scientific disciplines such as anatomy, biochemistry, physiology, and pharmacology.[7]

It is important that some scholars believe that the interpretation of TCM/TCVM as being a metaphysical- and energetic-based medicine is incorrect, and that this conceptual error is due, in part, to poor translation of the early Chinese texts. These scholars believe that ancient Chinese acupuncturists, lacking the diagnostic and anatomic insight and technologies we have today, described the vascular and peripheral neurologic system using the best descriptive vernacular available to them within the context of their daily lives. Some argue that if ancient Chinese acupuncturists were afforded the same technology and understanding of anatomy and physiology that we have today, they would have described acupuncture theory and practice using the same terminology and perspective we ascribe to contemporary Western acupuncture.[18,19] The ancient Chinese body maps depicting acupuncture points and *qi* meridians closely follow arterial and neurologic pathways. Some medical professionals believe that it is only logical to view acupuncture from a purely neurophysiologic basis and to discard all traditional Chinese theories of acupuncture. To discard more than 3000 years of empirical evidence seems equally illogical, when these extensive empirical observations may provide a useful guide to future research and understanding of acupuncture mechanisms.

Western acupuncture medicine has its basis in anatomy and physiology, with emphasis on the concept of trigger points, and neuroanatomy. The Western medical approach to acupuncture can provide an intelligible bridge for Western-trained medical professionals to allow the integration of acupuncture into their treatment regimes.

During the 1960s interest in acupuncture medicine increased in the West, with a dramatic upswing after Nixon's visit to China in the 1971. Americans were exposed to acupuncture via news reports and film. This new interest in TCM/TCVM allowed freer exchange of ideas, and veterinary professionals sought ways to incorporate the use of acupuncture into their practices. The Western veterinary approach to acupuncture, also referred to as "transpositional" acupuncture, developed at this time.[17] Ancient Chinese veterinary acupuncture point body maps existed only for cows, pigs, horses, and poultry, but these illustrated few acupuncture points with imprecise locations. In the 1970s in North America, veterinarians invited human acupuncturists from various parts of the world to assist them in devising point maps for dogs and cats using human point system maps as a template. Due to postural differences and variations in anatomy among animal species, placement of points did not correlate easily with human anatomy and point maps. The tail, for example, when it exists, represents an additional area for acupuncture stimulation that has no analogous site on the human body.

One method being used presently to resolve the problem of accurate point transposition from humans to animals involves identifying the neurovascular structures, peripheral nerve locations, and central nervous system associations to acupuncture points in humans. As neuroanatomical research of acupuncture points progresses and more of these correlations are made, veterinary acupuncturists will be able to identify the same anatomic structures on animals and thus be able to identify the location of the analogous human point.

Even more valuable to the advancement of veterinary acupuncture is the neuroanatomical research of acupuncture points being conducted directly on animal species. Ongoing research at the Colorado State University of Veterinary Medicine and the University of Veterinary Medicine in Florida is directed toward the creation of accurate transposition point location maps for the dog, cat, and horse.[20–22] To date, no comprehensive neuroanatomically accurate acupuncture point atlases exist for nonhuman species.[20,23]

MECHANISM OF ACTION

Although traditional Chinese and Western veterinary medical acupuncture theories differ, successful treatment is based on the same requirement: selection of effective acupuncture points or acupoints.[12] In traditional Chinese veterinary medical acupuncture, an acupoint is referred to as *Shu Xue* (pronounced shoo-shway, where *Shu* means transporting, distributing, communicating, and *Xue* means depression, hole, outlet). The acupoint is considered a hole in the skin that communicates with internal organs via a channel or meridian.[15] There are 361 classic acupoints associated with meridians, and more than 2000 extrameridian acupoints recognized in the ancient Chinese literature. Contemporary research has shown that 309 of these acupoints are located on or near nerves, and 286 acupoints are surrounded by small nerve bundles in close proximity to major blood vessels.[12,24]

The physiologic effects of acupuncture are the result of neuromodulation occurring from direct nerve stimulation.[23] The needling of tissue at an acupuncture point causes activation of the peripheral nervous system, which results in responses from the peripheral, autonomic and central nervous system.[11,12,25] Acupuncture causes neurohumoral and neuroendocrine changes that alter pain transmission and aid the body's intrinsic pain control mechanisms.[25]

The tingling, achy, or numb feeling noted by human patients receiving acupuncture is referred to as *de qi* (pronounced duh-chee or de-chee), and it is considered crucial by many to yield the best therapeutic effect. The variation in *de qi* sensation is thought to be the result of stimulation of the different types of afferent nerve fibers (II, III, or unmyelinated IV).[12,26,27]

Of the myriad effects acupuncture has on the body, analgesia has been the most scrutinized and is most represented in the literature. The precise mechanisms to describe acupuncture's effects are still under debate, but a growing body of evidence demonstrates that acupuncture analgesia has physiologic, anatomic, and neurochemical bases.[26] The dominant theory states that acupuncture (especially electroacupuncture) promotes analgesia via stimulation of certain receptor sites in the dorsal horn of the spinal cord, resulting in the release of neurochemicals such as β-endorphins, enkephalins, and serotonin.[28–32] Numerous studies involving humans and animals have demonstrated that electroacupuncture at various intensities is capable of producing analgesia owing to the release of different brain neuropeptides.[28,29,33] Peripheral stimulation of large sensory afferent nerves using electroacupuncture modulates nociceptive input into the spinal cord, producing analgesia following the "Gate Control Theory".[12]

Additional animal research revealed that acupuncture changes opioidergic and monoaminergic neurotransmission activity in the brainstem, thalamus, hypothalamus, and/or pituitary.[34,35] Clinical research also supports that acupuncture's effects are mediated through regulation of the autonomic nervous system. A study of irritable bladder symptoms in humans revealed improvement in detrusor (urinary bladder) muscle function equal in effect to standard drug therapy with oxybutynin.[36]

In 1997, Pomeranz[30] presented 17 lines of experimental evidence to support the neurophysiologic mechanism of acupuncture analgesia. A few key points from the extensive evidence he presented include: successful acupuncture requires an intact and functioning nervous system; the effects of acupuncture can be blocked by many opiate antagonists and by antibodies to endorphins (suggesting that acupuncture works partially via the release of endogenous endorphins); and individuals who share cerebrospinal fluid or blood via cross-circulation conditions show changes when only one of the individuals is needled.

Acupuncture has also been shown to inhibit inflammation, in part by activation of the hypothalamic-pituitary-adrenal axis, to increase circulation to muscle tissue and enhance nitric oxide generation, and to improve wound healing.[37,38] Acupuncture has been shown, in numerous species, to affect gastric and colonic motility and have antiemetic activity in humans associated with postoperative and postchemotherapy nausea/vomiting.[39–41]

The most promising research investigating acupuncture's mechanism of action involves the use of contemporary neuroimaging techniques such as functional magnetic resonance imaging, positron emission tomography, electroencephalography, and magnetoencephalography. These imaging modalities provide a safe method for monitoring brain activity while trying to map the neural correlates of acupuncture.[35,42,43]

The use of certain drugs (eg, opioids, glucocorticoids, benzodiazepines) has been shown to potentially enhance or interfere with the effects of acupuncture.[44–47] If acupuncture is to be integrated into a patient's treatment plan that includes the use of these medications, the acupuncturist and zoological companion animal practitioner should discuss where adjustments should be made to maximize the potential for combined therapies.

Safety

Acupuncture, if administered by a trained and experienced acupuncturist, does not pose a significant risk to the patient. In human acupuncture medicine serious complications have been described, but their occurrence is exceedingly rare.[48,49] The National Institutes of Health Consensus Statement states "one of the advantages of acupuncture is that the incidence of adverse effects is substantially lower than many of the drugs or other accepted procedures for the same conditions."[50] Prospective studies examining the incidence of adverse effects of acupuncture in humans have been conducted covering a variety of countries in a range of clinical conditions. A review of these studies revealed the rate of serious adverse effects to be 3 per million treatments, which is much less than many conventional medical treatments.[51]

Acupuncture should be used with caution in patients who are pregnant, have severe blood coagulopathies, are severely debilitated, or who are extremely febrile, while the use of electroacupuncture is contraindicated in all these patients. Electroacupuncture should also be avoided in patients with seizure disorders, severe local skin infections, and local malignancies.[25] Acupuncture needles should never be placed directly in neoplastic or infected tissue, or directly in open wounds.

An important consideration for the zoological companion animal practitioner who contemplates referring a patient for acupuncture is the acupuncturist's experience with zoological companion animals. If the acupuncturist is not familiar with the species to be referred, it may be possible for the acupuncturist to come to the practice of the zoological companion animal practitioner and provide the acupuncture service. This type of joint appointment can enhance the rapport between the zoological companion animal practitioner and the acupuncturist, as they both gain a better understanding of each other's specialty As this working relationship evolves and potential applications for acupuncture are realized, a more integrated approach to zoological animal veterinary care can result. Clients are often very appreciative of this cooperative approach because it emphasizes their veterinarian's devotion to their pet, a willingness to provide services beyond the scope of the clinic, and an open-minded attitude to patient care.

Pain in Zoological Companion Animals

Although an understanding of acupuncture's analgesic mechanism of action has advanced in recent years, most of the information is based on research using mice, rats, rabbits, nonhuman primates, dogs, and humans. Although similarities in neuroanatomy and physiology among animal species allow some extrapolation of information, many of our zoological companion animal species are unique, and comparisons cannot easily be made.

A further complication to species comparison exists in the area of pain recognition. The lack of a gold standard for pain assessment seriously hampers our ability to evaluate pain in zoological companion animal patients, and consequently to accurately judge the responses to analgesic acupuncture techniques. In 2002, an international, multidisciplinary workshop composed of 29 experts in animal and human pain was held to discuss the comparative aspects of pain research and treatment. One of the results of this meeting was the creation of a consensus statement identifying the need for a cross-species approach to the study of animal pain.[52] This consensus statement represents a call to action, intended to motivate human and veterinary medical professionals to communicate and collaborate in a cross-disciplinary manner in order to advance the study of pain in animals and humans.

Unique Aspects of Zoological Companion Animal Acupuncture

Behavioral aspects

The use of acupuncture in our zoological companion animal species presents unique challenges when compared with its use in domestic large and small mammals, but its potential for benefit is significant. Many of our zoological companion animal patients are inherently fractious and infrequently handled; as a result, they are less amenable to calming through tactile or vocal assurance than our domestic dogs and cats. In addition, many of our zoological companion animal patients are prey species who are wary of unfamiliar sensations and environmental situations. It is very important to assess the potential stress applied by any technique and consider whether the potential benefits outweigh the risks. In the hands of a competent acupuncturist who is familiar with the behavior and temperament of zoological companion animal species, acupuncture treatments can be tailored to the needs of the individual.

The excitable and highly energetic personality of most birds may impose the need for more physical restraint and greater practitioner patience to ensure the safe and effective administration of acupuncture. Psittacine birds may tolerate restraint for dry needle therapy if the owner is present to soothe and stroke the patient. Another approach that is effective with birds is to dim the lights until they are almost completely off, place the needles quickly, and have the bird remain within audible range of the owner's voice. Raptorial species that are accustomed to jesses and hoods will often readily accept dry needle acupuncture without restraint.

Small mammal patients such as rabbits, chinchillas, and guinea pigs are often very amenable to acupuncture therapy when provided a quiet and secure environment for treatment (**Fig. 2**). These patients tolerate dry needle treatments best when the needles are placed quickly and then the patient is released from restraint. The author prefers to allow rabbit patients to ambulate freely on a clinic floor, with access to food and interaction with companions, all the while with needles in place. Similarly, chelonian patients can sometimes be placed on platforms that prevent their limbs to contact the ground, and dry needles can be safely placed while they "ambulate" in midair (**Fig. 3**). Ferrets, rats, and mice can be more challenging patients, due to their energetic personalities and their inherent agility. Special attention needs to be paid to the ferret acupuncture patient because of its predisposition to investigation with its mouth and potential risk of foreign body (needle) ingestion.

Aquapuncture (the injection of minute amounts of sterile saline, injectable B vitamins, and so forth) can be used initially in specific calming acupoints to promote relaxation before the placement of the remaining needles. For highly stressed or hyperactive patients, the technique of aquapuncture may be used for the entire treatment, to deliver stimulation to the various acupoints quickly and to allow the fluid to provide the prolonged nerve activation usually created by longer duration of dry needle placement. The author has used the aquapuncture technique in many highly active ferrets, with good results.

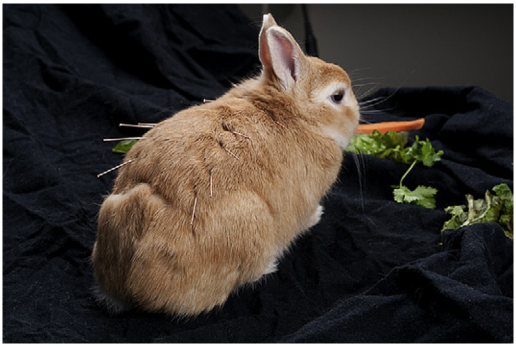

Fig. 2. Dry needle acupuncture treatment on a dwarf rabbit. (*Courtesy of* Don Preisler, UC Davis School of Veterinary Medicine, Davis, CA.)

A common benefit of acupuncture noted among humans and nonhuman patients alike is the sedating and almost tranquilizing effect acupuncture can promote. Many veterinary patients may appear nervous or reluctant during their initial acupuncture session, but they gradually relax and often fall asleep as the session progresses. It is thought that the release of mood-altering neurotransmitters produced by the needle

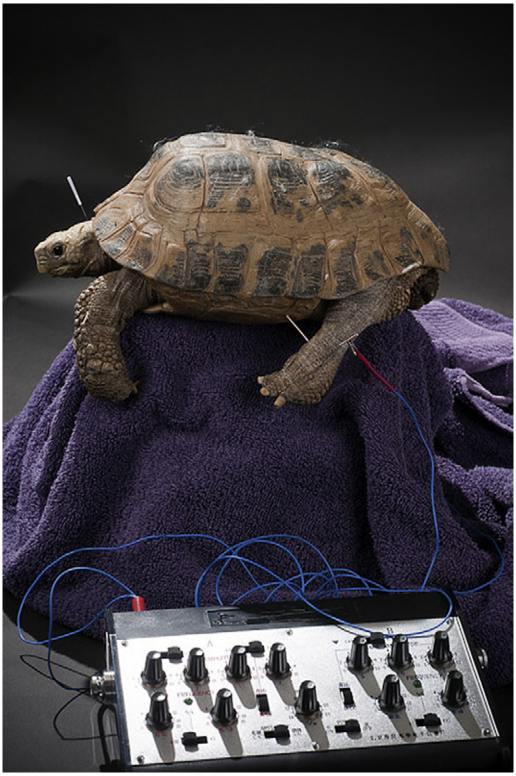

Fig. 3. Desert tortoise (*Gopherus agassizzii*), on suspended platform, undergoes both dry needle and electroacupuncture therapy. (*Courtesy of* Don Preisler, UC Davis School of Veterinary Medicine, Davis, CA.)

stimulation may be the cause of this response. This effect creates a rewarding scenario for the patient, client, and veterinarian, when treatments are a positive and relaxed experience.

Anatomic aspects

As previously stated, there are no comprehensive, neuroanatomically accurate acupuncture point maps for nonhuman species; some limited point guides have been presented. Drs Schoen, Partington, and Ferguson have described limited acupuncture point guides for avian species based on empirical point transposition and interpretation from ancient Chinese poultry acupoint charts.[15,53,54]

One of the most stunning obstacles we confront when using acupuncture in zoological companion species relates to the extreme anatomic diversity among the species and the resulting difficulty in point transposition. Chelonians, for example, with their carapace and plastron, limit the use of acupuncture sites to the limbs, head, and tail. Snakes present the opposite dilemma, with easy access to vertebral associated points and no options for extremity acupuncture points. In some species of reptiles, boney cutaneous plates and excessively thick skin create considerable barriers to acupuncture needle insertion. Avian species also present anatomic challenges to acupuncture treatment. Fusion of the boney skeleton along portions of the limbs (eg, tibiotarsus) and vertebrae (synsacrum and notarium) create problems of point transposition.

Due to the small size of many zoological companion animal species, acupoints are correspondingly small and located in close proximity to one another. Discerning individual points can be unrealistic, and some points may have to be avoided. In addition, the small size of some patients and the delicacy of their skin can pose significant risk of tendon or ligament damage or excessive blood loss when using dry needle or aquapuncture techniques. These tiny patients are best treated with dry needles that are not left in place; instead, a needle is placed in each acupoint and gently manipulated for 10 to 15 seconds, then removed, and a new needle is used to repeat the process in the next acupoint.[15]

Patient Selection for Acupuncture

The author recommends that acupuncture be considered early in the development of a patient's treatment plan and not be relegated to the "last resort" category of treatment options. This perspective is shared by practitioners of both evidence-based veterinary acupuncture and traditional Chinese veterinary medical acupuncturists. The TCVM practitioner views all signs of illness as an imbalance of energy and the longer the imbalance occurs untreated, the more the body progresses toward serious and potentially irreparable dysfunction.[30] From the perspective of the evidence-based acupuncturist, the use of acupuncture as a rescue therapy for terminal patients, such as those in organ failure, exhibiting severe nervous system dysfunction, or in end-stage neoplastic disease, is not appropriate. Acupuncture in these advanced cases may provide analgesia, relaxation, or appetite stimulation, but not cure. Successful acupuncture therapy requires the patient to have an intact functioning nervous system and usually involves multiple treatments.[30] As previously discussed, the use of certain drugs (eg, opioids) must also be considered when incorporating acupuncture into the treatment regimen, as they may interfere with acupuncture's efficacy.[47]

The most common uses for acupuncture in veterinary medicine are in the areas of pain management, geriatric medicine, and sports medicine.[18,55] Some conditions that may be helped by acupuncture include: cervical, thoracolumbar, and lumbosacral hyperpathia; orofacial pain; degenerative joint disease; intervertebral disc pain; perioperative

Table 1
Zoological companion animal conditions commonly considered for acupuncture therapy

Condition	Example
Musculoskeletal diseases/disorders	Degenerative joint disease (DJD) and osteoarthritis (eg, lumbar vertebral spondylosis in geriatric lagomorphs and osteoarthritis and DJD in guinea pigs secondary to chronic scurvy)
Hind limb paresis	Chelonians, lizards, and avian species: secondary to prolonged gravid status or trauma or disuse
Gastrointestinal disorders	Diarrhea and emesis in ferrets, ileus in lagomorphs, guinea pigs, chinchillas, chelonians, and lizards
Urinary incontinence not caused by bacterial infection or cystic calculi	Geriatric lagomorphs and rodents
Chronic cutaneous conditions	Slow-healing wounds and pruritus in all species, avian feather picking

and postoperative pain; vestibular disease; degenerative myelopathy; chronic visceral hyperalgesia; anorexia; tendon/ligament injuries; chemotherapy-associated emesis; gastrointestinal motility disorders (colic, ileus); asthma; sinusitis; and generalized weakness.[18,25,36,40,56–64]

The clinical research literature devoted to the use of acupuncture in zoological companion animal species is heavily skewed toward rats, mice, rabbits, and (to some degree) ferrets, due to the use of these species in human comparative and veterinary medical research. The specific application of acupuncture to the individual avian, reptile, lagomorph, and rodent patient is represented primarily by anecdotal information and isolated case reports in the literature.[65–68]

The selection of appropriate zoological companion animal patients for acupuncture depends on several criteria, with the most important including the potential stress of the treatment on the patient, the experience of the acupuncturist with the specific species, the nature of the disease to be treated, the client's compliance to an acupuncture treatment schedule, and the feasibility of the treatment goals. Patients being considered for acupuncture should receive individualized treatment plans devised by the zoological companion animal practitioner and the acupuncturist. **Table 1** is a list of conditions common to zoological companion animals, representing a few examples of common conditions that may be identified by owners and veterinarians, and amenable to acupuncture therapy. Acupuncturists do not direct the use of acupuncture to specific conditions but instead treat the whole animal; however, **Table 1** offers the clinician a guide for potential referral to an acupuncturist.

SUMMARY

Human medical and veterinary interest in acupuncture has grown dramatically in recent years, especially in the area of analgesia. The limited evidence-based literature specific to zoological companion animal acupuncture and analgesia emphasizes the need for further research to expand the knowledge and understanding of these unique patients. This article is intended to provide a guide for the zoological companion animal practitioner to gain a basic understanding of acupuncture and its potential for use in the zoological companion animal patient.

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